

Sub
P1

wherein the storage units store data in a plurality of data groups and error correcting data corresponding to each of the data groups;

CS

wherein the storage units are susceptible to a fault occurring in any of the storage units, the fault affecting data stored in any of the storage units in which the fault has occurred, the affected data belonging to at least one of the data groups; and

wherein the controller performs processing of reconstructing the affected data based on all other data belonging to each of the at least one of the data groups and error correcting data corresponding to each of the at least one of the data groups to which the affected data belongs, performs processing of data read/write requests from the host unit, and determines an amount of the processing of reconstructing data instead of the processing of data read/write requests based on a predetermined time.--

REMARKS

It is noted that a personal interview has been scheduled for Thursday, April 6, 2000, at 10:30 AM, and it is respectfully requested that the Examiner not issue a response to the present amendment until after the interview has been conducted.

The applicants and their representatives would like to express their appreciation to Primary Examiner Hoa T. Nguyen for the courtesy of the personal interview conducted on November 17, 1999.

A substitute specification has been provided, the substitute specification and claims 18, 20-21, 24, and 26-30 have been amended, claim 22 has been cancelled, and new claims 32-44 have been added. Claims 18-21, 24, and 26-44 are pending, with claims 18, 21, 24, 26-30, 32-33, 36-42, and 44 being independent.

New claim 32 has been added to recite the invention in different terms, and new claims 33-44 respectively correspond to claims 18-21, 24, and 26-32 rewritten to eliminate the use of means-plus-function language.

The Examiner has required a substitute specification because the amendments to the specification requested in the preliminary amendment of September 29, 1998, are too numerous to be entered.

Accordingly, pursuant to 37 CFR 1.125(b) and MPEP 608.01(q), attached hereto is a substitute specification which replaces the original specification, together with a marked-up copy of the original specification showing the matter being added to and deleted from the original specification. The substitute specification includes no new matter, and the substitute specification includes the same changes as are indicated in the marked-up copy of the original specification, which include all of the changes to the original specification requested in the preliminary amendment of September 29, 1998, and the amendment of October 14, 1999.

It is respectfully requested that the substitute specification be entered.

The specification was objected to under 37 CFR 1.175(d)(1) and MPEP 608.01(o) as failing to provide proper antecedent basis for the terms in claims 22, 24, and 26-30 identified in section 6 of the Office Action of April 14, 1999.

The preliminary amendment of September 29, 1998, was objected to under 35 USC 132 as introducing new matter into the specification because the Examiner is of the opinion that the features of claims 22, 24, and 26-30 identified in section 7 of the Office Action of April 14, 1999, are not supported by the original disclosure. The Examiner has required that this alleged new matter be cancelled.

Claims 22, 24, and 26-31 were rejected under 35 USC 112, first paragraph, as containing subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the applicants, at the time the application was filed, had possession of the claimed invention for the reasons discussed in the explanations of the objection to the specification under 37 CFR 1.175(d)(1) and MPEP 608.01(o) and the objection to the preliminary amendment of September 29, 1998, under 35 USC 132 set forth in sections 3-4 of the Office Action of January 3, 2000.

The objection to the specification under 37 CFR 1.175(d)(1) and MPEP 608.01(o), the objection to the preliminary amendment of September 29, 1998, under 35 USC 132, and the rejection under 35 USC 112, first paragraph, have been rendered moot with respect to claim 22 by the cancellation of

claim 22, are respectfully traversed with respect to claims 24, 26, and 28-31, and are respectfully traversed insofar as they may be deemed to be applicable to claim 27 in its present form and to new claims 37-44.

It is submitted that the phrase the controller [. . .] controls an amount of time for the processing of reconstructing data within a unit time based on a predetermined limit time in claims 24 and 37 has an antecedent basis in and is supported by, for example, steps 192, 194, and 198 in Fig. 9, and the corresponding portion of the substitute specification as amended by the present amendment, such as, for example, page 22, line 21, through page 23, line 26, of the substitute specification as amended by the present amendment (corresponding to page 22, line 1, through page 23, line 7, of the original specification) which describes steps 192, 194, and 198 in Fig. 9.

It is submitted that the phrase the controller [. . .] controls an amount of the processing of reconstructing data based on a predetermined limit time in claims 26 and 38 has an antecedent basis in and is supported by, for example, steps 132 and 136 in Fig. 6 and steps 192, 194, 198, and 202 in Fig. 9, and the corresponding portions of the substitute specification as amended by the present amendment, such as, for example, page 19, lines 1-7, and page 19, line 18, through page 20, line 4, of the substitute specification as amended by the present amendment (corresponding to page 18, lines 10-16, and page 18, line 27, through page 19, line 13, of the

original specification) which describe steps 132 and 136 in Fig. 6.

It is submitted that the phrase the controller [. . .] determines an amount of the processing of reconstructing data instead of the processing of data read/write requests such that the processing of reconstructing data is completed within a fixed period of time in claims 27 and 39 has an antecedent basis in and is supported by, for example, steps 132 and 136 in Fig. 6 and steps 192 and 202 in Fig. 9, and the corresponding portions of the substitute specification as amended by the present amendment, such as, for example, page 19, lines 1-7, and page 19, line 18, through page 20, line 4, of the substitute specification as amended by the present amendment (corresponding to page 18, line 10-16, and page 18, line 27, through page 19, line 13, of the original specification) which describe steps 132 and 136 in Fig. 6.

It is submitted that the phrase the controller [. . .] performs the processing of reconstructing data in preference to the processing of data read/write requests such that the processing of reconstructing data is completed within a fixed period of time in claims 28 and 40 has an antecedent basis in and is supported by, for example, steps 132 and 136 in Fig. 6 and steps 192 and 202 in Fig. 9, and the corresponding portions of the substitute specification as amended by the present amendment, such as, for example, page 19, lines 1-7, and page 19, line 18, through page 20, line 4, of the substitute specification as amended by the present amendment (corresponding to page 18, line 10-16, and page 18, line 27,

It is submitted that the phrase the controller gives the preference based on a predetermined limit time in claims 31 and 43 has an antecedent basis in and is supported by, for example, steps 132 and 134 in Fig. 6 and steps 192, 194, and 196 in Fig. 9, and the corresponding portions of the substitute specification as amended by the present amendment, such as, for example, page 19, lines 1-18, of the substitute specification as amended by the present amendment (corresponding to page 18, line 10-27, of the original specification) which describes steps 132 and 134 in Fig. 6.

It is submitted that the phrase the controller [. . .] determines an amount of the processing of reconstructing data instead of the processing of data read/write requests based on a predetermined time in claims 32 and 44 has an antecedent basis in and is supported by, for example, steps 132, 134, and 136 in Fig. 6 and steps 192, 194, 198, and 202 in Fig. 9, and the corresponding portions of the substitute specification as amended by the present amendment, such as, for example, page 19, line 1, through page 20, line 4, of the substitute specification as amended by the present amendment (corresponding to page 18, line 10, through page 19, line 13, of the original specification) which describes steps 132, 134, and 136 in Fig. 6.

The arguments presented above with respect to claims 24, 26, and 28-31 (except for the references to the substitute specification) were also presented in the amendment of October 14, 1999, and were discussed during the interview on November

through page 19, line 13, of the original specification) which describe steps 132 and 136 in Fig. 6.

It is submitted that the phrase the controller [. . .] performs the processing of reconstructing data instead of the processing of data read/write requests such that the processing of reconstructing data is completed within a fixed period of time in claims 29 and 41 has an antecedent basis in and is supported by, for example, steps 132 and 136 in Fig. 6 and steps 192 and 202 in Fig. 9, and the corresponding portions of the substitute specification as amended by the present amendment, such as, for example, page 19, lines 1-7, and page 19, line 18, through page 20, line 4, of the substitute specification as amended by the present amendment (corresponding to page 18, line 10-16, and page 18, line 27, through page 19, line 13, of the original specification) which describe steps 132 and 136 in Fig. 6.

It is submitted that the phrase the controller [. . .] gives a preference to the processing of data read/write requests and performs the processing of reconstructing data within a remaining time in claims 30 and 42 has an antecedent basis in and is supported by, for example, step 122 in Fig. 5; step 134 in Fig. 6; step 144 in Fig. 7; step 184 in Fig. 8; and step 196 in Fig. 9, and the corresponding portions of the substitute specification as amended by the present amendment, such as, for example, page 15, lines 17-26, of the substitute specification as amended by the present amendment (corresponding to page 15, line 2-11, of the original specification) which describes step 122 in Fig. 5.

time" in the label on element 198 in Fig. 9 and the phrase "the ratio of the amount of data reconstruction within the unit time" on page 22, lines 21-22, of the specification as originally filed (emphasis added).

As discussed during the interview, this discrepancy has now been eliminated by the present amendment wherein the phrase "the ratio of" has been deleted on page 5, line 24; page 7, line 6; page 23, lines 13, 19, and 23; and page 25, line 5, of the substitute specification. In light of this, it is submitted that there is no longer any reason for the Examiner to maintain the objection to the specification under 37 CFR 1.175(d)(1) and MPEP 608.01(o), the objection to the preliminary amendment of September 29 under 35 USC 132, and the rejection of claims 24 and 26-31 under 35 USC 112, first paragraph.

Accordingly, for the reasons discussed above, it is respectfully requested that the objection to the specification under 37 CFR 1.175(d)(1) and MPEP 608.01(o), the objection to the preliminary amendment of September 29 under 35 USC 132, and the rejection of claims 24 and 26-31 under 35 USC 112, first paragraph, be withdrawn.

Claims 18-22, 24, and 26-31 were rejected under 35 USC 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which the applicants regard as the invention due to the deficiencies in claims 18, 20-22, 24, and 26-30 identified in section 7 of the Office Action of January 3, 2000. The rejection of claim 22 has been rendered moot by the

cancellation of claim 22. The rejection of claims 18-21, 24, and 26-31 is respectfully traversed insofar as it may be deemed to be applicable to these claims in their present form.

Claims 18, 20-21, 24, and 26-30 have been amended to eliminate the deficiencies identified by the Examiner in section 7 of the Office Action of January 3, 2000.

Accordingly, it is submitted that claims 18, 20-21, 24, and 26-30 and claims 19 and 31 depending from claims 18 and 30 are now in compliance with 35 USC 112, second paragraph, and it is respectfully requested that the rejection of claims 18-21, 24, and 26-31 under 35 USC 112, second paragraph, be withdrawn.


It is submitted that all of the Examiner's objections and rejections have been overcome, and that the application is now in condition for allowance. Reconsideration of the application and an action of a favorable nature are respectfully requested.

To the extent necessary, the applicants petition for an extension of time under 37 CFR 1.136. Please charge any shortage in fees due in connection with the filing of this paper, including extension of time fees, or credit any

overpayment of fees, to the deposit account of Antonelli,
Terry, Stout & Kraus, LLP, Deposit Account No. 01-2135
(500.31108CC4).

Respectfully submitted,

ANTONELLI, TERRY, STOUT & KRAUS, LLP



Carl I. Brundidge
Registration No. 29,621

CIB/RSS
(703) 312-6600

Attachments